15

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,889	10/06/2003	Wilhelm Hinsen	SWR-0121	3811

7590 07/22/2005

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EXAMINER	
WEBB, GREGORY E	
ART UNIT	**PAPER NUMBER**
1751	

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/679,889	**Applicant(s)** HINSEN ET AL.
	Examiner Gregory E. Webb	**Art Unit** 1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2004*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-16* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☒ All b)☐ Some * c)☐ None of:
1.☒ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *020204*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 1-04) **Office Action Summary** Part of Paper No./Mail Date 072005

7/20/05

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Horowitz (US 6,340,580).

Concerning the bio-polymer, Horowitz teaches the following:

> A method has been developed for isolating and purifying polyhydroxyalkanoates ("PHAs")from biomass comprising PHAs. The method

> includes the step of extracting PHA from the biomass using at least one solvent while simultaneously subjecting the biomass to a filtration process to remove cells.(see col. 2, lines 60-65)

Concerning the porous granules, Horowitz teaches the following:

> For example, U.S. Pat. No. 5,364,778 to Byrom discloses an aqueous method wherein biomass comprising PHA is maintained as an aqueous slurry in which the PHA is generally insoluble. The slurry is subjected to various treatments designed to digest, degrade, or otherwise make water-soluble the non-PHA biomass. This solubilized biomass then is removed from the slurry by centrifugation, filtration, or other means. Aqueous-based routes, however, generally have certain disadvantages, particularly which applied to large scale processing. Examples of these disadvantages include (a) effective purification is made more difficult because many impurities, including some surfactants useful for the solubilizing treatments, may be tightly adsorbed to the surface of the PHA particles; (b) many volumes (i.e. large quantities) of wash water may be required by the process, creating used wash water and its attendant disposal difficulties; (c) multiple solubilizing treatments may be required to obtain high purity PHA; (d) drying of the water-based PHA slurry may be time-consuming and costly; (e) PHA particles may cause extensive fouling of filtration membranes, centrifuges, and other process equipment; and (f) solubilizing treatments may require expensive reagents and lengthy process times and/or

> high temperatures to be effective.(see col. 1, lines 22-45)

Concerning the organic solvent, Horowitz teaches the following:

> 10. The method of claim 8 wherein the aqueous slurry and organic solvent form a solvent-water mixture, the method further comprising gradually increasing the concentration of organic solvent in the solvent-water mixture.(see claim 10)

Concerning the steam distillation, Horowitz teaches the following:

> Solvent recovery can be carried out by processes well known to those skilled in the art and includes distillation or extraction into a second solvent or solvent mixture which is not miscible with water and subsequent separation by distillation(see col. 6, lines 40-45)

Concerning the preferred solvents, Horowitz teaches the following:

> Specific examples include acetone, butyl acetate, isobutyl acetate, ethyl lactate, isoamyl acetate, benzyl acetate, 2-methoxy ethyl acetate, tetrahydrofurfuryl acetate, propyl propionate, butyl propionate, pentyl propionate, butyl butyrate, isobutyl isobutyrate, ethyl butyrate, ethyl valerate, methyl valerate, benzyl benzoate, methyl benzoate, dimethyl succinate, dimethyl glutarate, dimethyl adipate, isobutyl alcohol, 1-butanol, 2-methyl-1-butanol, 3-methyl-1 butanol, 1-pentanol, 3-pentanol, amyl alcohol, allyl alcohol, hexanol, heptanol, octanol, cyclohexanol, 2-ethylhexanol, tetrahydrofurfuryl alcohol, furfuryl alcohol, benzyl alcohol, 2-furaldehyde, methyl isobutyl ketone, methyl ethyl ketone,

> g-butyrolactone, methyl n-amyl ketone, 5-methyl-2-hexanone, ethyl benzene, 1,3-dimethoxybenzene, cumene, benzaldehyde, 1,2-propanediol, 1,2-diaminopropane, ethylene glycol diethyl ether, 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, 1,3-dioxane, 1,4-dioxane, 1-nitropropane, toluene-2,4-diisocyanate, acetic acid, acrylic acid, acetic anhydride, alpha-methylstyrene, acetophenone, toluene, ethylene glycol diacetate, dimethyl sulfoxide, dimethyl acetamide, dimethyl formamide and propylene carbonate.(see col. 6)

Concerning the cleaning method, Horowitz teaches the following:

> A method is provided for isolating and purifying PHA from biomass which comprises PHA. The method includes the step of extracting PHA from the biomass using at least one solvent while simultaneously subjecting the biomass to a filtration process to remove cells. In a preferred embodiment of the method, biomass comprising PHA (for example an aqueous slurry of microbial cells obtained from a fermentation process) is directly extracted by diafiltration sing an organic solvent, to obtain PHA.(see col. 2, lines 12-20)

Claims 1-3, 5-7, 9-12, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurdikar et al (WO 01/68890A2).

Kurdikar teaches a method of separating PHB from biomass using an organic solvent such as chloroform and then separating the PHB from an aqueous phase, and finally separating the PHB from the solvent via gravity precipitation (see page 2, lines 1-4).

Claims 1-3, 5-7, 9-12, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Eggink et al (US 5,958,480).

Eggink teaches PHB/PHA extraction and purifications processes which separate the biopolymer from other biomass. Eggink teaches creating an aqueous dispersion of the PHA and biomass, then washing and cetrifugation (see col. 5, lines 12-53).

Eggink further teaches the use of an organic solvent for the final extraction (see col. 5, lines 55-68).

Claims 1-3, 5-12, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Noda (US 5,821,299).

Concerning the bio-polymer, Noda teaches the following:

> "Extracting polyhydroxyalkanoate from a biomass", in addition to referring to the extraction of the particular PHA produced by a biomass which produces a single PHA, also refers to the extraction of one or more types of PHA when the biomass produces more than one type of PHA.(see col. 3, lines 17-20)

Concerning the porous granules, Noda teaches the following:

> Separation of PHA by sedimentational methods should be, in principle, possible. However, simple gravitational (1-G force) settling in a liquid marginal nonsolvent for PHA is, in fact, quite impractical. The rate of settling is extremely slow. In addition, such slow settling is easily disrupted by the Brownian motion of the fine PHA particles induced by the

> thermal fluctuation of the suspending fluid molecules surrounding the particles. Furthermore, the extended period of time required to settle very fine PHA particles introduces the problem of bacterial contamination and subsequent biodegradation of the particle suspension.(see col. 1, lines 54-64)

Concerning the polyhydroxyalkanoate, Noda teaches the following:

> 1. A process for separating polyhydroxyalkanoate from a biomass comprising the polyhydroxyalkanoate, the process comprising:(see claim 1)

Concerning the preferred solvent, Noda teaches the following:

> In a more environmentally benign process, the PHA solvent preferably is acetone, butyl acetate, ethyl acetate, methyl acetate, or mixtures thereof; more preferably acetone or ethyl acetate; more preferably still, acetone.(see col. 5, lines 36-40)

Conclusion

It is less common for PHA to use the applicant's specific isoamyl alcohol. It is much more common to use less soluble solvents. Should the applicant specifically state that the biopolymer is polyhydroxyalkanoate and the cleaning solvent is isoamyl alcohol, such modifications should, pending further search, place the applicant's claims in condition for allowance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregory E. Webb
Primary Examiner
Art Unit 1751

gew